

FOR PUBLICATION
UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

EARTH ISLAND INSTITUTE, a
California non-profit organization;
CENTER FOR BIOLOGICAL DIVERSITY,
a non-profit organization,
Plaintiffs-Appellants,

v.

UNITED STATES FOREST SERVICE;
DALE BOSWORTH, Chief of the
United States Forest Service; JOHN
BERRY, Forest Supervisor for El
Dorado National Forest,
Defendants-Appellees,

SIERRA PACIFIC INDUSTRIES,
*Defendant-intervenor-
Appellee.*

No. 05-16776

D.C. No.
CV-05-01608-MCE

OPINION

Appeal from the United States District Court
for the Eastern District of California
Morrison C. England, District Judge, Presiding

Argued and Submitted
January 9, 2006—San Francisco, California

Filed March 24, 2006

Before: John T. Noonan, A. Wallace Tashima, and
William A. Fletcher, Circuit Judges.

Opinion by Judge William A. Fletcher;
Concurrence by Judge Noonan

COUNSEL

Rachel Marie Fazio, John Muir Project, Cedar Ridge, California, for the appellants.

Ronald M. Spritzer and Jeffrey S. Dillen, United States Department of Justice, Washington, D.C., for the appellees.

C. Athena Roussos, Jay Allen Eisen Law Corp., Sacramento, California; David E. Martinek, Dun & Martinek, Eureka, California, for the intervenor-appellee.

OPINION

W. FLETCHER, Circuit Judge:

Plaintiffs Earth Island Institute and the Center for Biological Diversity (collectively, “Earth Island”) appeal the district court’s denial of their motion for a preliminary injunction enjoining the implementation of two United States Forest Service (“USFS”) post-fire restoration projects in the El Dorado National Forest. Sierra Pacific Industries (“SPI”) has joined defendants USFS, Dale Bosworth, and John Berry as an intervenor.

Earth Island contends that the Final Environmental Impact Statements (“FEISs”) for both projects fail to meet the requirements set forth in the National Environmental Policy Act (“NEPA”), 42 U.S.C. § 4321 *et seq.*, because the USFS used faulty scientific methodology in developing its tree mor-

tality guidelines, and because the FEISs failed to consider adequately the adverse impacts of the projects on the California spotted owl. Earth Island also contends that the FEISs fail to comply with the National Forest Management Act (“NFMA”), 16 U.S.C. § 1600 *et seq.*, because the USFS did not compile sufficient population data for certain bird Management Indicator Species (“MIS”).

The district court denied Earth Island’s request, finding (1) that the methodology employed in the FEISs with respect to the tree mortality guidelines was not arbitrary and capricious; (2) that the FEISs took a “hard look” at the adverse impacts of the projects on the California spotted owl, and (3) that the USFS had gathered sufficient population monitoring data for certain bird species that have been categorized as MIS. For the reasons set forth below, we hold that Earth Island has shown a “strong likelihood of success on the merits” of its NEPA and NFMA claims, and that it has otherwise satisfied the requirements for a preliminary injunction. We reverse and remand to the district court for further proceedings consistent with this opinion.

I. Statutory and Factual Background

In October 2004, two substantial fires burned portions of the El Dorado National Forest. The first, known as the Power Fire, consumed 16,993 acres of National Forest as well as additional acres of private land. The Power Fire burned at varying levels of intensity. According to the FEIS prepared for the Power Fire Restoration Project, approximately 38% of the forest area burned at low intensity; approximately 13% burned at moderate intensity, killing 25% to 75% of the trees; and approximately 48% burned at high intensity, killing 75% to 100% of the trees as well as burning the duff and litter protecting the soil. Several Protected Activity Centers (“PACs”), Home Range Core Areas (“HRCAs”), and Riparian Conservation Areas (“RCAs”) for the California Spotted Owl were located in the Power Fire area. Certain MIS cavity-nesting

birds, notably the hairy woodpecker, black-backed woodpecker, and Williamson's sapsucker, were present in Power Fire area.

The second fire, known as the Freds Fire, burned 7,700 total acres, 4,600 of which were in the National Forest. Like the Power Fire, the Freds Fire burned at varying levels of intensity. According to the FEIS, approximately 12% burned at low intensity; approximately 11% burned at moderate intensity, killing 33% to 66% of the trees; and approximately 61% burned at high intensity, killing 66% to 100% of the trees as well as burning the duff and litter protecting the soil. An additional 16% of young plantations also burned at high intensity. California spotted owl PACs, HRCAs, and RCAs were also located in the Freds fire area. The hairy woodpecker, black-backed woodpecker, and Williamson's sapsucker were also present in the Freds Fire area.

In response to the two fires, the USFS undertook the Power Fire Restoration Project and the Freds Fire Restoration Project. Both projects must comply with federal statutes as well as the relevant regional forest plans.

Under NEPA, federal agencies must prepare detailed environmental impact statements on every proposed action that "significantly affects the quality of the human environment." 42 U.S.C. § 4332(C). These statements must include a description and analysis of the environmental impact of the proposed action, any adverse environmental effects that cannot be avoided if the action is implemented, alternatives to the proposed action, the relationship between short-term uses and long-term productivity, and any irreversible or irretrievable commitment of resources that would be involved if the action were to be implemented. *Id.* In short, NEPA requires that a federal agency "consider every significant aspect of the environmental impact of a proposed action" and "inform the public that it has indeed considered environmental concerns in its decisionmaking process." *Kern v. U.S. Bureau of Land*

Mgmt., 284 F.3d 1062, 1066 (9th Cir. 2002) (internal quotations omitted). NEPA does not contain substantive environmental standards but instead establishes procedural requirements designed to ensure that agencies take a “hard look” at the environmental consequences of their actions. *Id.*

Under the NFMA, the USFS must develop land and resource management plans for each unit of the National Forest System. 16 U.S.C. § 1604(a). In developing such plans, “a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences” must be used. *Id.* § 1604(b). The NFMA and regulations promulgated thereunder impose substantive environmental requirements. *See* 36 C.F.R. § 219.12. Each forest plan must also comply with NEPA. 16 U.S.C. § 1604(g)(1).

The Sierra Nevada Framework Plan Amendment (the 2001 Framework) is the relevant NFMA forest plan for the El Dorado National Forest. The 2001 Framework is a comprehensive forest plan that establishes a “comprehensive conservation strategy” for national forests in the Sierra Nevada Mountains, including the establishment of PACs for the California spotted owl, defined as the best available 300 acres of owl habitat surrounding a known or suspected nesting site. *Earth Island Inst. v. U.S. Forest Serv.*, 351 F.3d 1291, 1296 (9th Cir. 2003). Logging within PACs under the 2001 Framework is severely restricted, “generally to the reduction of surface and ladder fuels.” *Id.* In addition, the 2001 Framework requires that HRCAs, defined as 1000-acre foraging grounds for the California spotted owl, be maintained surrounding each PAC. *Id.*

In 2004, the 2001 Framework was supplemented by a Final Supplemental Environmental Impact Statement (the 2004 Supplement) that included a revised plan to improve fire prevention and suppression, reduce fuel loads, restore fire-adapted ecosystems, and promote community assistance. The

Record of Decision (“ROD”) implementing the 2004 Supplement provides that “[s]ite-specific decisions [regarding timber sales] will be made on projects in compliance with NEPA, [the Endangered Species Act], and other environmental laws following applicable public involvement and administrative appeal procedures.”

The El Dorado National Forest is also managed under the El Dorado National Forest Land and Resource Management Plan (the “LRMP”). The LRMP identifies certain bird Management Indicator Species (“MIS”) that aid the USFS in establishing objectives for improving habitat and for evaluating the quantity and quality of habitat and species population trends, in accordance with the NFMA.

Both the Power and Freds Project must conform with the 2001 Framework, the 2004 Supplement, and the LRMP, each of which must in turn comply with NEPA and the NFMA. The USFS identified four key goals for the two post-fire restoration projects:

- (1) to reduce long-term fuel loading in order to reduce future fire severity and resistance to control;
- (2) improve roads and establish effective ground cover in severely burned areas to reduce erosion and sedimentation to streams in the short term, and to contribute to long term soil productivity;
- (3) recover the economic value of timber killed or severely injured by the fire, in an expeditious manner, for the purpose of generating funds to offset the cost of future restoration activities; and
- (4) reduce safety hazards to the public and forest workers.

Freds Fire Restoration, 69 Fed. Reg. 77,175-02 (Dec. 27, 2004).

In furtherance of the third goal, the Power Project was divided into six timber sales. One of these, the East Panther

sale, was awarded to SPI, which contracted to remove dead trees from 1,363 acres of the Power Fire area. The Freds Project was divided into two sales. One of these, the Fred Fire Salvage sale, was also awarded to SPI, which contracted to remove dead trees from 1,363 acres of the Freds Fire area.

A Notice of Intent to prepare an Environmental Impact Statement for the Power Fire was published in the Federal Register on December 22, 2004, and for the Freds Fire on December 27, 2004. Power Fire Restoration, 69 Fed. Reg. 76,686-01 (Dec. 22, 2004); Freds Fire Restoration, 69 Fed. Reg. 77,175-01 (Dec. 27, 2004). After a comment period, Draft Environmental Impact Statements were published in the Federal Register on March 25, 2005. Environmental Impact Statements; Notices of Availability, 70 Fed. Reg. 15,315-01 (Mar. 25, 2005).

On June 16, 2005, the Forest Supervisor for the El Dorado National Forest, John Berry, requested an Emergency Situation Determination from the Regional Forester pursuant to 36 C.F.R. § 215.10. According to the request, “substantial loss of economic value to the Federal Government will occur if implementation of the [Record of Decision] were delayed. Loss of economic value will in turn jeopardize the implementation of the project[s] resulting in long term consequences to the environment.” The request noted that with an Emergency Determination, RODs for the two projects could be issued as early as August 1, 2005, but without such a determination, the RODs might not be issued until the end of October. A delay would have the consequence of postponing large portions of the logging operations until summer 2006.

Such a delay would cause deterioration of the timber to be salvaged, which would thereby reduce USFS’s revenues from those sales. The Forest Supervisor anticipated that the loss from delay would be \$11.3 million for the Power Project and \$800,000 for the Freds Project. On July 1, 2005, the Regional

Forester granted the requests for Emergency Situation Determinations for both Projects.

On July 1, 2005, the USFS issued FEISs for both Projects. Both FEISs used mortality guidelines to predict which trees will eventually die from their fire-related injuries, and which trees should therefore be logged. The guidelines are based on a draft study by Sharon M. Hood, Sheri L. Smith, and Daniel R. Cluck (the Hood Study). The Hood Study estimated the probability of mortality for different tree species based, according to the study, “on an analysis of the largest dataset available in terms of numbers of trees and species from wild-fires in California.”

On August 1, 2005, the final RODs for both projects were issued. The Power ROD chose Alternative Four; the Freds ROD chose Alternative One. Both RODs stated that the risk of cutting trees that would otherwise survive is mitigated by relying upon the data contained in the Hood Study, which provides models “that allow managers to select the desired level of predicted mortality based on land management objectives.” Among the stated reasons put forth for having chosen Alternatives Four and One was the fact that each Alternative would generate the greatest revenue for the USFS: \$19,056,425 for the Power Project, and \$3,345,872 for the Freds Project.

Earth Island brought suit in federal district court seeking a preliminary and permanent injunction against the implementation of the Power and Freds Projects. On August 18, 2005, the district court granted Earth Island’s motion for a Temporary Restraining Order (“TRO”) pending that court’s determination of whether a preliminary injunction should issue. On August 25, 2005, the district court vacated its August 18 TRO and denied Earth Island’s motion for a preliminary injunction.

In this expedited appeal, Earth Island argues that the district court (1) applied an erroneous legal standard for preliminary

injunctions by requiring a showing of significant irreparable harm; (2) applied an erroneous legal standard to Earth Island's claim that the USFS failed to ensure scientific integrity in its tree mortality guidelines; (3) erred as a matter of law by concluding that both FEISs met NEPA's requirement that they take a "hard look" at the adverse effects of the projects on the California spotted owl; (4) erred as a matter of law by concluding that the USFS did not violate the NFMA by failing to conduct population surveys of certain MIS bird species; (5) erred as a matter of law by concluding that Earth Island had not shown the possibility of irreparable harm to the California spotted owl and certain bird species; and (6) erred as a matter of law by concluding that the balance of hardships did not tip in Earth Island's favor. On September 15, 2005, Earth Island filed an emergency motion for an injunction pending appeal with this court, which was denied by a motions panel on September 22, 2005. After oral argument, we *sua sponte* reconsidered our September 22 denial and, in an order filed January 11, 2006, issued an injunction pending the issuance of this opinion.

We have jurisdiction pursuant to 28 U.S.C. § 1291(a)(1). We now reverse the decision of the district court and hold that Earth Island has met the requirements for a preliminary injunction. We remand to the district court for further proceedings consistent with this opinion.

II. Standard of Review

A district court's decision granting or denying preliminary injunctive relief may be reversed only if the court abused its discretion. *See Harris v. Bd. of Supervisors*, 366 F.3d 754, 760 (9th Cir. 2004); *Earth Island*, 351 F.3d at 1298. A court abuses its discretion if it based its decision on an erroneous legal standard or clearly erroneous findings of fact. *Earth Island*, 351 F.3d at 1298. We review findings of fact for clear error and conclusions of law de novo. *See Hawkins v. Comparet-Cassani*, 251 F.3d 1230, 1239 (9th Cir. 2001);

Brown v. Cal. Dep't of Transp., 321 F.3d 1217, 1221 (9th Cir. 2003). We “typically will not reach the merits of a case when reviewing a preliminary injunction By this we mean we will not second guess whether the court correctly applied the law to the facts of the case, which may be largely undeveloped at the early stages of litigation. As long as the district court got the law right, it will not be reversed simply because the appellate court would have arrived at a different result if it had applied the law to the facts of the case.” *Earth Island Inst.*, 351 F.3d at 1298 (quoting *Rucker v. Davis*, 237 F.3d 1113, 1118 (9th Cir. 2001) (en banc)).

We view Earth Island’s challenges through the lens of the Administrative Procedures Act (“APA”). Under the APA, agency decisions may be set aside only if “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(2)(A). Review under this standard is narrow, and the reviewing court may not substitute its judgment for that of the agency. *See U.S. Postal Serv. v. Gregory*, 534 U.S. 1, 6-7 (2001). The agency, however, must articulate a rational connection between the facts found and the conclusions reached. *Midwater Trawlers Co-op v. Envtl. Def. Ctr.*, 282 F.3d 710, 716 (9th Cir. 2002). We reverse under the arbitrary and capricious standard only if the agency has relied on factors that Congress has not intended it to consider, has entirely failed to consider an important aspect of the problem, or has offered an explanation for that decision that runs counter to the evidence before the agency or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise. *See Sierra Club v. U.S. Envtl. Protection Agency*, 346 F.3d 955, 961 (9th Cir. 2003), *amended by* 352 F.3d 1187 (9th Cir. 2003).

III. Mootness

In light of the extensive logging that has already taken place pursuant to the Power and Freds RODs, we asked the parties to advise us whether this appeal may have become

moot. The USFS concedes that this appeal is not moot with respect to the Power Project. For the Power Project, the USFS reported that 100% of the timber harvest has been completed for the East Panther and Camp Creek sales, but that only 77% of harvesting has been completed on the Cole Creek sale, only 73% has been completed for the Ellis sale, only 29% has been completed for the Bear River sale, and only 15% has been completed for the Rocky Knob sale. The USFS indicated that due to winter weather conditions, logging operations on the uncompleted projects has now ceased but are expected to resume during the spring of 2006.

According to the USFS, as of January 5, 2006, the timber harvesting that had been authorized for the Freds Project was completed, and it was expected that all harvested timber would be removed from the land and transported to mills by January 9, 2006. However, Earth Island argues that even if current logging operations have been completed for the Freds Project, the logging sales contracts were issued for a term of two years, meaning that SPI has a continuing right to cut trees that meet the tree mortality guidelines contained in the FEIS.

[1] “A case becomes moot whenever it loses its character as a present, live controversy of the kind that must exist if we are to avoid advisory opinions on abstract propositions of law . . . [T]he question is not whether the precise relief sought at the time of the application for an injunction was filed is still available. The question is whether there can be any effective relief.” *Cantrell v. City of Long Beach*, 241 F.3d 674, 678 (9th Cir. 2001) (internal quotations and alterations omitted). In *Neighbors of Cuddy Mountain v. Alexander*, 303 F.3d 1059 (9th Cir. 2002), we concluded that challenges brought under NEPA and the NFMA were not moot simply because logging operations had already been completed. There, we noted that remedial measures continued to be available. For example, the USFS could still study and mitigate the impact of the sales on species viability, adjust future timber sales to compensate for the allegedly unlawful sale, and directly monitor bird popula-

tion trends. *Id.* at 1066. In *Cantrell*, we evaluated mootness under NEPA and concluded that although historic buildings with important bird habitats had already been torn down, the defendants in that case could still consider alternatives and develop ways to mitigate the damage to the birds' habitat. *Cantrell*, 241 F.3d at 678-79.

[2] Similarly, we conclude in this case that the completion of current logging operations in the Freds Fire area does not render the controversy about the Freds Project moot. Not only is it possible that SPI might cut more trees. In addition, as in *Neighbors of Cuddy Mountain* and *Cantrell*, there are a variety of measures that could provide some effective relief, including revising the tree mortality guidelines, monitoring of the California spotted owl, and obtaining more accurate population surveys of MIS bird species.

IV. Preliminary Injunction Standard

Earth Island seeks to enjoin logging operations in the Power and Freds Project areas until its NFMA and NEPA claims are adjudicated in federal court. It argues that the district court applied an erroneous legal standard by requiring something beyond the "possibility of irreparable harm" when it denied Earth Island's request for a preliminary injunction. Specifically, Earth Island points out that in analyzing the USFS's obligation to monitor certain woodpecker species, the district court found that "immediate and irreparable" injury had not been shown. With respect to the California spotted owl, the district court did not discuss harm at all; instead, it simply concluded that Earth Island had shown no probability of success on the merits.

[3] A district court "necessarily abuses its discretion when it bases its decision on an erroneous legal standard or on clearly erroneous findings of fact." *Rucker v. Davis*, 237 F.3d 1113, 1118 (9th Cir. 2001) (en banc), *rev'd on other grounds*, *Dep't of Hous. & Urban Dev. v. Rucker*, 535 U.S. 125 (2002).

In this case, we conclude that the district court applied an improper legal standard when assessing whether a sufficient level of injury had been shown.

We recently had occasion to pass upon the proper legal standard governing preliminary injunctive relief in a case involving the same parties, the same district court judge, and a very similar set of facts. *Earth Island*, 351 F.3d 1291. In that case, Earth Island sought a preliminary injunction against logging operations provided for in the USFS's Star Fire Restoration Project after the 2001 Star Fire in the Sierra Nevadas. *Id.* at 1295. We identified two sets of criteria for preliminary injunctive relief. Under the "traditional" criteria, a court may grant a preliminary injunction if a plaintiff shows "(1) a strong likelihood of success on the merits, (2) the possibility of irreparable injury to plaintiff if preliminary relief is not granted, (3) a balance of hardships favoring the plaintiff, and (4) advancement of the public interest (in certain cases)." *Id.* at 1297 (internal quotations omitted). Alternatively, a court may grant a preliminary injunction if a plaintiff "demonstrates *either* a combination of probable success on the merits and the possibility of irreparable harm *or* that serious questions are raised and the balance of hardships tips sharply in his favor." *Id.* at 1298 (internal quotation marks omitted).

[4] In *Earth Island*, we held that the district court had applied an improper legal standard by requiring that Earth Island demonstrate "actual harm . . . as opposed to speculation that some such harm could possibly occur." *Id.* In that case, the district judge noted that Earth Island had "failed to show that measures already in place . . . will not afford sufficient protection" and that Earth Island had "failed to identify any concrete probability of irreparable harm in any other respect." *Id.* We concluded that "[e]ach of these statements places a higher burden of proof on the plaintiff than is warranted." *Id.* We emphasized that a preliminary injunction "only requires plaintiffs to show *probable* success on the merits and the *possibility* of irreparable harm." *Id.*

In its August 25, 2005 order in this case, the district judge stated, correctly, that in order to prevail on a motion for a preliminary injunction, a party must demonstrate either “(1) a combination of probable success on the merits and the possibility of irreparable harm; or (2) that serious questions are raised and the balance of hardships tips sharply in favor of granting the requested injunction.” However, the district judge continued, stating that under either standard, a party must show a “significant threat of irreparable injury.” During the hearing, the district judge stated that “even if there is shown to be a probability of success on the merits by the plaintiffs, the plaintiffs have not shown at this time that there is a significant threat of irreparable injury by clear and convincing evidence, which is the standard.”

[5] The USFS argues that the district court applied the appropriate legal standard as set forth in our decision in *Oakland Tribune, Inc. v. Chronicle Publ’g Co.*, 762 F.2d 1374 (9th Cir. 1985), because the words “significant threat of irreparable injury” are not the equivalent of the “concrete probability of irreparable harm” standard we held to be erroneous in *Earth Island*. While it is true that “significant threat” and “concrete probability” are different words, what matters is that both standards impose a higher burden of proof on Earth Island by going beyond the “mere possibility of irreparable harm” standard. In *Oakland Tribune*, we first determined that plaintiff had shown a very low likelihood on the success of the merits of its claim, thereby justifying the higher standard of harm. Here, the district court applied the higher standard from the outset without first determining the probability of Earth Island’s success on the merits.

[6] We conclude that the district court applied an erroneous legal standard. As we discuss below, we conclude that Earth Island has shown a “strong likelihood of success on the merits,” and has also satisfied the other criteria of degree of injury, balance of hardships, and advancement of the public interest.

V. Discussion

A. Likelihood of Success on the Merits of Earth Island's NEPA Challenges

[7] NEPA's procedural requirements require agencies to take a "hard look" at the environmental consequences of their actions. A hard look includes "considering all foreseeable direct and indirect impacts." *Idaho Sporting Cong. v. Rittenhouse*, 305 F.3d 957, 973 (9th Cir. 2002). In addition to direct and indirect impacts, NEPA also requires that agencies assess the cumulative impacts of their actions, defined as the "incremental impact of the action when added to past, present, and reasonably foreseeable future actions." 40 C.F.R. § 1508.7.

[8] A hard look should involve a discussion of adverse impacts that does not improperly minimize negative side effects. *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1241 (9th Cir. 2005). Thus, the USFS must "undertake a thorough environmental analysis before concluding that no significant environmental impact exists." *Id.* at 1239 (internal quotations omitted). We review whether the USFS has taken a hard look under the arbitrary and capricious standard. When reviewing the adequacy of an FEIS's hard look, we follow a "rule of reason" approach, which requires "a pragmatic judgment whether the [FEIS's] form, content and preparation foster both informed decision-making and informed public participation." *Native Ecosystem Council v. U.S. Forest Serv.*, 418 F.3d 953, 960 (9th Cir. 2005); *see also Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 767 (2004).

Under NEPA, "[a]gencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement." 40 C.F.R. § 1502.24. Agencies have wide discretion in assessing scientific evidence, but they

must “take a hard look at the issues and respond[] to reasonable opposing viewpoints.” *Earth Island*, 351 F.3d at 1301. “Because analysis of scientific data requires a high level of technical expertise, courts must defer to the informed discretion of the responsible federal agencies.” *Id.* “When specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own experts, even if a court may find contrary views more persuasive. At the same time, courts must independently review the record in order to satisfy themselves that the agency has made a reasoned decision based on its evaluation of the evidence.” *Id.* (quoting *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 378 (1989)). If an agency has failed to make a reasoned decision based on an evaluation of the evidence, we may properly conclude that an agency has acted arbitrarily and capriciously. *Id.* at 1301.

[9] The primary purpose of an FEIS is to allow for informed public participation and informed decision making. See *Native Ecosystems*, 418 F.3d at 965. In furtherance of this purpose, 40 C.F.R. § 1502.8 requires that FEISs “be written in plain language and may use appropriate graphics so that decisionmakers and the public can readily understand them.” As we have interpreted this regulation, an FEIS “must be organized and written so as to be readily understandable by governmental decisionmakers and by interested non-professional laypersons likely to be affected by actions taken under the [FEIS].” *Or. Env'tl. Council v. Kunzman*, 817 F.2d 484, 494 (9th Cir. 1987).

1. NEPA Challenges to the FEISs

Analysis of Logging Activities

Earth Island challenges various aspects of the analyses of logging contained in the two FEISs. Most significantly, it challenges the analysis of tree mortality and the use of the proposed mortality guidelines contained in the Power and

Freds FEISs. It also challenges the FEISs' conclusions that there is a lack of adequate soil cover in the project areas, and that the retention of large snags (dead trees) would result in a hazardous level of surface fuels.

a. Tree Mortality Guidelines

Earth Island argues that the FEISs' guidelines for cutting burned and scorched trees substantially overpredict tree mortality, with the result that many more trees will be cut than are necessary to meet the legitimate objectives of the Power and Freds Projects. Earth Island argues that by cutting many trees that will not die, the USFS will unnecessarily destroy valuable habitat for the California spotted owl and certain MIS bird species.

The tree mortality guidelines contained in the FEISs are based upon the 2005 draft Hood Study. That study predicts post-fire mortality for trees burned or scorched in forest fires. The guidelines for both projects are keyed to the percentage of the tree's green crown that has been scorched by the fires.

Based on data contained in the Hood Study, the USFS chose two different marking guidelines, one for areas to be logged by tractor and one for areas to be logged by helicopter or skyline. Table 3-5 of both of the FEISs is entitled "Mortality Guidelines for marking as applied to [various alternatives]." For simplicity of explanation, we will describe the guidelines only as they apply to yellow pine and white fir, and only as to helicopter and skyline logging. Yellow pine with 65% or more of the length of their crown scorched are considered dead, and are to be marked for cutting. The same crown length scorch percentages apply to white fir over 20" in diameter.

For the convenience of the reader, we reproduce Table 3-5:

	PP/JP/SP [yellow pine]	White Fir <20"	White Fir >20"	Incense Cedar	Red Fir	Douglas Fir
Tractor Logging System						
Crown Scorch*	75%	95%	80%	100%	?	?
Crown Scorch + RTB or Ambrosia Beetle	?					
Helicopter and Skyline Logging Systems						
Crown Scorch*	65%	85%	65%	95%	?	?
Crown Scorch + RTB or Ambrosia Beetle	?					

*As a percentage of the original live crown. Percentage of green foliage would not be used for ponderosa or Jeffrey pine until the 2005 needle flush is visible. Any marking prior to needle flush would be limited to pines with 100% black crown.

Table 3-6 of the FEISs is entitled “Probability of Tree Mortality.” Both FEISs state, “Table 3-6 indicates the probability of tree mortality to individual trees meeting the Power [and Freds] Fire marking guidelines (Correctly Predicted Mortality) and the predicted survival of trees with less fire damage than the minimum requirements of the marking guidelines (Correctly Predicted Survival).” According to Table 3-6, a yellow pine cut in accordance with the 65% crown length scorch guideline of Table 3-5 has a 90% “Correctly Predicted Mortality.” A white fir over 20” in diameter cut in accordance with the guidelines has a 87% “Correctly Predicted Mortality.”

For the convenience of the reader, we reproduce Table 3-6. We have italicized the numbers 90 and 87 to indicate the “correctly predicted mortality” percentages for yellow pine and white fir cut in accordance with the 65% crown length scorch guideline:

	PP/JP/SP [yellow pine]	White Fir	Incense Cedar	Red Fir	Douglas Fir
Tractor Logging System					
Correctly Predicted Mortality (%)	96	95	100	100	—
Correctly Predicted Survival (%)	51	63	88	—	—
Helicopter and Skyline Logging Systems					
Correctly Predicted Mortality (%)	90	87	85	100	—
Correctly Predicted Survival (%)	65	74	89	—	—

Earth Island contends that the findings contained in the draft Hood Study, as well as in other studies, have substantially different percentage estimates of tree mortality from the percentages contained in Table 3-6. Earth Island relies upon the declaration of Dr. Edwin B. Royce in support of its contention. Royce has a Ph.D. in Botany with a specialization in Forest Plant Ecology from the University of California at Davis, and a Ph.D. in Applied Physics from Harvard University. Royce has had twelve years of experience in the characterization of forest vegetation.

The USFS challenges the admissibility of Royce's declaration, as well as other expert declarations offered by Earth Island, because they were not before the agency during the administrative review process. We allow extra-record materials if necessary to "determine whether the agency has considered all relevant factors and has explained its decision." *Sw. Ctr. for Biological Diversity v. U.S. Forest Serv.*, 100 F.3d 1443, 1450 (9th Cir. 1996). Because Earth Island's expert declarations are offered for this purpose, they were properly before the district court and are properly before this court on review.

According to Royce, yellow pine and white fir are both "thick bark trees" whose bark provides significant protection

of the living tissue beneath the bark. According to Royce, “[c]rown kill is commonly the dominant source of fire-induced mortality in large trees having thick bark, such as white fir or yellow pine.” However, “[f]all fires, such as the Power and Fred’s fires, are least damaging to conifers. In part this is because reserves of stored products of photosynthesis are high and because new growth throughout the trees is less vulnerable to damage then, as compared to that same growth during the summer growing season.” “A low-intensity surface fire commonly produces only partial crown kill and only minimal mortality in larger trees. Trees tolerate partial crown kill in a surface fire in part because only the lower part of the crown is normally killed. The lower part of the crown is less photosynthetically productive than is the upper part.”

For yellow pine, Royce states, “[t]he mortality guidelines for yellow pine (ponderosa and Jeffrey pine) will permit the harvest of trees with a substantial probability of surviving if they were not harvested.” The Royce declaration contains tables showing predicted tree mortality in the Hood Study, as well as in three other studies. Those other studies were by Ryan and Reinhardt, by Stephens and Finney, and by McHugh and Kolb. Royce states as to yellow pine, “[f]or helicopter and skyline logging, mortalities from the [Hood Study] models are 60% and 70%, as compared to a 90% mortality claimed in the FEIS and ROD.” Mortalities predicted by the three other studies are even more at variance from the mortality predicted in the FEISs. Royce states,

[T]he guidelines for helicopter and skyline logging will allow the cutting of small trees that have probabilities of mortality between 12% and 57% and large trees with mortality probabilities between 11% and 32% (compared with 90% mortality claimed by the FEIS’s). Even if one accepts only the largest of the probabilities of mortality — that given by the Ryan and Reinhardt paper — this still translates into *a worst case probability of survival of up to 68% for*

trees that could be cut (meaning 68% of the trees logged would otherwise survive). (Emphasis in original.)

In addition, Royce states that he personally evaluated 39 yellow pine that were part of the data base for the Hood Study, and “found evidence of measurement errors that would lead to the development of models that over predict mortality.” According to Royce,

I measured the average amount of crown kill on these trees to be 88%, whereas, the [Hood Study] field workers evaluated the same damage to average 64%. A small part of this difference may be due to the fact that my measurements were crown volume measurements, whereas, the [Hood Study] measurements were linear measurements. However, as discussed [earlier in my declaration], this should produce only a few percent difference between the two measurements. I suggest that at least a substantial part of the difference between the two measurements is a result of the [Hood Study] field workers underestimating crown kill. This will result in a model that over predicts mortality when correct crown kill values are used. A corrected [Hood Study] model yielding lower mortality predictions would make the proposed guidelines even less defensible.

For white fir, Royce states, “[t]he mortality guidelines for large white fir will permit the harvest of trees with a substantial probability of surviving if they were not harvested.” As he does for yellow pine, Royce presents tables showing predicted tree mortality in the Hood Study, as well as in the three other studies. He states as to white fir, “[f]or the helicopter and skyline logging of large trees, mortalities from the [Hood Study] models are between 25% and 45%, as compared to an 87% mortality claimed in the FEIS and ROD.” Just as with yellow

pine, mortalities predicted by the three other studies are even more at variance from the mortalities predicted in the FEISs. Royce states,

the guidelines for helicopter or skyline logging will allow the cutting of large trees with mortality probabilities between 7% and 50%, as compared to the 87% mortality claimed in the FEIS's. Even if one accepts only the largest of these predictions of mortality — that given by the Ryan and Reinhardt paper — this still translates into *a worst case probability of survival (in helicopter units) of up to 50% for trees that could be cut.* (emphasis in original).

In response, the USFS relies on a declaration of Sheri L. Smith. Smith is one of the three co-authors of the draft Hood Study. She has B.S. and M.S. degrees in Biology and Entomology from Utah State University. She has been an USFS employee for 15 years. She has been “involved in evaluating fire-injured trees in California since 1991.”

Smith makes three points in response to the Royce declaration. First, she contends that Royce misunderstood Table 3-6. As noted above, that table is entitled “Probability of Tree Mortality.” Royce understood the percentages contained in that table as indicating the probability that a tree will die. For example, Table 3-6 indicates that a yellow pine with a minimum of 75% scorched crown (the guideline for tractor logging) has a “correctly predicted mortality” of 96%, and a “correctly predicted survival” of 51%. Royce understood the table to mean that 96% of yellow pine with a minimum of 75% scorched crown will die.

Smith responds,

The marking guidelines used for the Power and Freds fire are based on models that use percent crown kill I attach a true and correct copy of

an excerpt of the models which are the basis for the Power and Freds marking guidelines (Attachment A).

Mr. Royce states that Table 3-6 represents that 96% of trees with 75% crown kill will die. This is simply incorrect. The 96% in Table 3-6 (classification table) shows that the marking guideline model used by the Forest Service is correct in predicting mortality 96% of the time when our individual study trees are run through the model. In other words, the 96% is an estimate of the accuracy of the model, not of the percentage of mortality as Mr. Royce states. Both FEISs accurately interpret the findings of our paper in light of the specific marking guideline model selected by the Forest Service.

The percentages shown in Table 3-6 (classification table) of both the Power and Freds EIS are derived from the entire [Hood Study] dataset, which, for yellow pine, is based on measurements of 1,969 trees. The models in our paper take these percentages to arrive at a statistical probability of mortality for an individual tree. The probability of mortality (Pm) ranges from 0.0 to 1.0, with 1.0 being certain mortality. The Forest Service selected a Pm of 0.90 for all ground-based harvest units. For yellow pine, a Pm of 0.90 corresponds to a crown length kill of 75%. Using this criterion, the marking guideline model correctly predicted mortality for yellow pine trees in the [Hood Study] dataset 96% of the time and correctly predicted survival 50% of the time. In other words, using a Pm of 0.90 (75% crown kill), only 4% of the trees the model predicts will die, actually survived, but 50% of the trees predicted to survive eventually died. . . .

This means that there is a high likelihood of correctly predicting mortality, but a lower likelihood of

correctly predicting survival using the 75% crown scorch model, *which means that it is much more likely that the Forest Service is leaving trees behind that will later die, than it is taking trees that would have survived.* This is directly contrary to Mr. Royce’s assertions[.] . . . The same misinterpretation of the data is true for Mr. Royce’s discussion of yellow pine on helicopter and skyline harvest units and all white fir, all of which misinterpret the percentages in Table 3-6 to be something other than what they are — a verification of the accuracy of the marking guideline model using the [Hood Study] dataset.

(emphasis in original).

Second, Smith responds that Royce estimated the probability that a tree will die based on the percentage *volume* of crown kill. By contrast, the Hood Study estimated the probability based on the percentage *length* of crown kill. Therefore, according to Smith, Royce’s comparisons are “problematic.”

Third, Smith responds that two of the three other studies upon which Royce relies for his comparison — the studies of Stephens and Finney, and of McHugh and Kolb — are based on “prescribed fires.” According to Smith, “[m]ost often, the objective of a prescribed fire is to limit the mortality of the overstory while reducing fuel loadings and ingrowth of smaller trees. Our model is more appropriate to the type of fire represented by the Freds and Power fires, which killed not only the ingrowth of smaller trees, but also resulted in high levels of crown kill of larger trees.”

We analyze Smith’s three points in turn. First, Smith contends Royce has misunderstood Table 3-6. According to Smith, the percentage figures given for “correctly predicted mortality” — such as 96% for yellow pine with a minimum of 75% crown length scorch — do not predict the percentage

of trees that will die. Rather, these figures predict the accuracy of the prediction of the percentage of these trees that will die. Similarly, according to Smith, the percentage figures for “correctly predicted survival” — such as 51% for yellow pine with a minimum of 75% crown length scorch — do not predict the percentage of trees that will live. Rather, they predict the accuracy of the prediction of the percentage of these trees that will live. Smith may well be correct. Indeed, it appears from the face of Table 3-6 that she may be, for if the table predicted the percentage of trees that will die or live, as distinct from predicting the accuracy of the predictions of these percentages, the percentages given in the table should add up to 100%. Instead, in the example given for yellow pine with 75% crown length scorch, they add up to 147% (96% plus 51%).

[10] But even if Smith is correct, this does not solve the problem. Table 3-6 is, to say the least, misleading. Its title is “Probability of Tree Mortality,” rather than “Probability that Predictions of Probability of Tree Mortality and Survival are Correct.” Second, there is no *other* table in the FEISs providing the probability of tree mortality. The absence of such a table is significant. The single most important aspect of the FEISs is their estimate of the likelihood that trees with certain amounts of fire damage will die. This is so for the obvious reason that the justification for cutting burned or scorched trees is the likelihood that they will die. Any reader of the FEISs will therefore look for a table providing probability of tree mortality. The only table in the FEISs that appears to provide that information is Table 3-6. It is not unforeseeable that a reader — even an expert reader such as Royce — would misunderstand the table. Further, the explanation for Table 3-6 provided by Smith’s declaration in the district court is nowhere provided in the FEISs. For example, Attachment A to Smith’s declaration is not provided, or even referred to, in the FEISs. The absence of such an explanation in the FEISs obviously increases the chance that the table will be misunderstood.

Further, the Royce declaration provides tree mortality percentages given in the draft Hood Study, and he compares those percentages to those given in Table 3-6. The Hood Study percentages provided by Royce are not contested by Smith. (This is not surprising, given that Smith is a co-author of the Hood Study.) The Hood Study mortality percentages are substantially lower than the percentages given in Table 3-6. Yet those percentages are not provided in the text of the FEISs. If the USFS had been truly interested in educating the reader as to the actual percentages of trees likely to die from scorch damage, it would have provided those percentages in the FEISs. Instead, it provided Table 3-6 (entitled “Probability of Tree Mortality”) giving percentages of “correctly predicted mortality.” Even if the USFS could properly rely on the draft Hood Study instead of other tree mortality studies — a question we do not here decide — it should have provided the mortality percentage figures in the Hood Study rather than, or in addition to, the figures in Table 3-6.

Second, Smith responds that the comparisons used by Royce to estimate tree mortality are based on percentage *volume* of crown kill rather than percentage *length* of crown kill. We note initially that Smith’s response has no application to the comparison between the percentage numbers given in Table 3-6 and those given in the Hood Study. Both Table 3-6 and the Hood Study were based on the same methodology — correlating percentage length of crown kill with likelihood of tree death. Further, we note that with respect to studies that relied on percentage volume rather than percentage length of crown kill, Royce had explained in his declaration why the FEISs’ emphasis on the difference in the two type of crown kill measurements is misleading. He wrote:

Tables 3-4 in both the Power and Fred’s fire FEIS’s show a relationship between these two measures of crown kill in which the volume measure is much larger than the linear measure for the same amount of damage. However, these tables are valid

only for young trees with a tapered shape, similar to the classic conical Christmas tree shape shown in figure F-1 of the Powers FEIS or figure A-1 of the Fred's FEIS. Large, mature trees growing in a forest surrounded by other trees have a shape more like a cylinder, tapered only in the topmost branches. . . . It is to mature trees that the guidelines [in the FEIS's] are to be applied to determine if the trees are dying and hence subject to salvage harvest. In the context of the salvage of mature trees, the inclusion of these tables and figures in the FEIS's is completely misleading.

My experience measuring mature trees on the Eldorado-Star fire site . . . was that, within the uncertainty with which these determinations can be made in the field, the two measures give the same numerical value for crown kill.

Third, Smith responds that two of the three other studies used by Royce for comparison were based on "prescribed fires." According to Smith, reliance on these two studies — the Stephens and Finney study and the McHugh and Kolb study — was inappropriate because the Power and Freds Fires "resulted in high levels of crown kill of larger trees" compared with the levels of crown kill in the prescribed fires. It may well be that, as Smith says, the prescribed fires resulted in lower levels of crown kill in larger trees. But Smith does not explain why that makes a difference. As those two studies are described by Royce, they predict tree mortality based on the actual percentage of crown kill in particular trees. The fact that fewer trees have that degree of crown kill in a prescribed fire should not make any difference in the predicted mortality of those trees that actually have a high level of crown kill.

Further, Smith does not mention the third study upon which Royce relies — the Ryan and Reinhardt study. Of the three studies, this one gives the highest probability of tree mortal-

ity. Royce explicitly discusses and relies on the Ryan and Reinhardt study in his conclusion that the FEISs overpredict tree mortality. For example, as indicated above, Royce writes with respect to yellow pine, “[e]ven if one accepts only the largest of these probabilities of mortality — that given by the Ryan and Reinhardt paper — this still translates into a worst case probability of survival of up to 68% for trees that could be cut[.]”

We recognize that the FEISs discount two of the studies — those by Stephens and Finney and by Ryan and Reinhardt. The Power and Freds FEISs both discount the Stephens and Finney study on the ground that its purpose was not to provide salvage guidelines, and that some of its data were obtained pre- rather than post-fire. The Powers FEIS discounts the Ryan and Reinhardt study as involving only one of the species (Douglas fir) that occurs in the Power Fire area. The Freds FEIS discounts that study in slightly different terms, stating, “[r]esults from the Ryan and Reinhardt 1988 study were obtained mostly for tree species not found in, and geographic regions not related to, the Sierra Nevada.” But even if we must discount both of these studies — a question we do not decide — the McHugh and Kolb study remains. That study was not discussed, or discounted, in either of the FEISs.

[11] In the end, we conclude that the USFS abused its discretion in its estimates of likely tree mortality in both the Power and Freds FEISs. We will assume, for purposes of our analysis, that the Smith declaration correctly states what the percentage numbers in Table 3-6 really mean. But even if the Smith declaration is correct, Table 3-6 is, for the reasons given above, extremely misleading. A casual, or even a careful, reader of the FEISs and of Table 3-6 could easily conclude that 96% of yellow pine with a minimum of 75% crown length scorch will die, or that 90% with a minimum of 65% crown length scorch will die. If those were, in fact, the percentages of yellow pine with that degree of fire damage that

will die, it would be easy to conclude that the USFS is justified in cutting all yellow pine that satisfy those criteria. But those are not the percentages of trees that will die.

The Hood Study itself estimates a substantially lower tree mortality than the percentage numbers provided in Table 3-6. The other three studies estimate even lower tree mortalities. It is possible that those who prepared the FEISs, and the Forest Supervisor who signed the RODs based on the FEISs, understood Table 3-6 in the way Royce understood it. If this is so, the USFS abused its discretion, for it failed to take the requisite “hard look” at the data underlying their analysis and decision. *Kern*, 284 F.3d at 1066. It is also possible that those who prepared the FEISs, and the Forest Supervisor, understood Table 3-6 in precisely the way Smith described it in her declaration. If this is so, the USFS also abused its discretion, for it failed to reveal the actual percentages upon which it relied and it drafted highly misleading FEISs. *Native Ecosystem Council*, 418 F.3d at 965. Under the first alternative, the USFS misunderstood the data; under the second, it understood but concealed and misrepresented the data. Under either alternative, it abused its discretion.

b. Soil Cover

Both the Power and the Freds FEISs state that a goal of the restoration projects is to provide effective ground cover as a means of reducing erosion and stream sedimentation. Both FEISs specify that the average soil cover should be between 50% to 60%. The FEISs propose to achieve this amount of soil coverage by using debris from trees that are logged according to the mortality guidelines discussed above — in their words, by using “tops and limbs of dead and dying trees.”

According to the Power FEIS, there was an average of 11% to 30% ground cover in areas of moderate-severity burns after the fire. There was an average of 0% to 10% ground cover in

areas of high-severity burns. The average projected ground cover after needles scorched by the fire had fallen to the ground was estimated to be 51% to 70% in moderate-severity burn areas, and 20% to 30% in high-severity burn areas. According to the Freds FEIS, there was an average of 17% ground cover in moderate-severity burn areas, and an average of 9% in high-severity burn areas. Following needlecast, the projected ground cover was 46% in moderate-severity burn areas, and 19% in high-severity burn areas.

Earth Island argues that these figures for soil coverage are based on information obtained in site visits immediately after the fire, and that more recent visits show that effective soil cover already exceeds 50% to 60% in severely burned areas. In support of this argument, Earth Island offers the declaration of Jonathan J. Rhodes. Rhodes has a B.S. in Hydrology and Water Resources from the University of Arizona, and an M.S. in Hydrology and Hydrogeology from the University of Nevada-Reno. He has also finished all required academic work toward a Ph.D. in forest hydrology at the University of Washington. He has had more than twenty-two years of experience as a hydrologist.

Rhodes visited what he described as six high-severity burn areas within the Power Fire area on August 11, 2005. He found that needles, twigs, and branches that had fallen since the fire, as well as new vegetative growth, had increased soil cover substantially. He stated in his declaration:

I measured soil cover in areas where my visual estimates indicated that soil cover was lowest. Thus, my measurements include those in areas with soil cover that is well below the average within the proposed Power project area as a whole. My measurements and evaluation of soil cover conditions within the areas of the proposed Power logging project unequivocally demonstrate that as of August 11, 2005, soil cover is well-distributed and greater than

60% in the overwhelming majority of areas burned at high severity. In the areas that I measured soil cover, the lowest level of soil cover that I measured was 59%; soil cover in the other five areas measured ranged from 66-91%. Even this lowest level of measured soil cover exceeds the 50% target that Power and Freds FEIS state should be exceeded.

Rhodes continued, “[b]ased on conditions within the area, it is unquestionable that soil cover from [conifer regeneration, and needles, branches, and logs from burned trees] will continue to steadily increase over the next several years.” He concluded, “there is *not* a pressing need to try to increase soil cover via logging in order to reduce soil erosion. This is especially true because logging always causes increased soil damage and elevated erosion.” (emphasis in original).

The USFS responded with a declaration by Jeffrey TenPas. TenPas has a M.S. in Soil Science from the University of California, Davis. He is an employee of the USFS. He has had more than fifteen years of experience in soil science. TenPas assessed soil cover immediately after the Power Fire. He then revisited the Power Fire area on August 19, 2005, after reading Rhodes declaration. TenPas wrote, “[c]ontrary to Mr. Rhodes findings, portions of the high severity burned areas in the Power Project area have existing ground cover much less than 50%.” He suggested that Rhodes might have been examining a “more moderately burned area that received significant needle cast,” rather than a high-severity burn area. TenPas stated:

The pattern of recovery [in the Power Project area] was consistent with expectations. Needle cast had provided adequate ground cover in low and moderate severity burned areas. Bear clover, where it was present, covered an estimated 0 to 70% cover at the scale of 200’ transects. In high severity burned areas, bear clover was the predominant component in vege-

tative recovery in areas I visited. Various forbs provided a trace to 5% cover. In high severity burned areas without bear clover, ground cover was as low as 1%, that from a trace of needles.

He concluded, “[i]n sum, my observations indicate that there remain portions of high severity burned areas where soil cover is deficient. . . . Timber harvest can contribute additional cover in these areas.”

[12] As in *Earth Island*, we conclude that “[a]t this stage, the record does not allow us to conclude that the Forest Service acted arbitrarily and capriciously in relying on its own data and discounting the alternative evidence offered by the Plaintiffs.” *Earth Island*, 351 F.3d at 1302. This is especially so in light of the deference given to the “reasonable opinions of [an agency’s] own experts.” *Id.* at 1301.

c. Fuel Loading

Both the Power and Freds FEISs state that a goal of the restoration projects is to reduce fuel loading on the ground so as to reduce the risk of future catastrophic fires, and to avoid safety hazards to workers and recreation visitors. Specifically, the Power FEIS rejected an alternative that would have retained four large snags per acre outside PACs for the California spotted owl. The Freds FEIS rejected an alternative that would have retained four to eight large snags per acre outside PACs. Earth Island challenges the FEISs’ rejection of these alternatives, arguing that retaining this number of large snags would not impede the goals of reducing long-term fuel loading and safety hazards.

According to the Power FEIS, in areas where four large snags per acre would be retained, fuel levels 25 years after the fire would be approximately 38 to 40 tons per acre. According to the Freds FEIS, in areas where four to eight snags per acre would be retained, fuel loads would be 16 to 50 tons per acre

by year 25. The USFS contends that these levels of fuel loading would provide significant fuel, contribute to severe soil heating, and impede effective fire suppression efforts.

[13] As with soil cover, above, we cannot confidently discern from the present record whether Earth Island's contentions about fuel-loading have validity. We therefore cannot say, at this point, that the USFS has acted arbitrarily and capriciously in rejecting the alternatives that would have retained four snags per acre in the Power Fire area and four to eight snags per acre in the Freds Fire area.

2. NEPA Challenge to Analysis of Effects of Logging on California Spotted Owls

Earth Island argues that the USFS has failed to take a "hard look" at the effects of the Power and Freds Projects on the California spotted owl. The California spotted owl was identified as a "species at risk" in the 2001 Framework. "Species at risk are those with a high level of concern whose ranges are not peripheral to the Sierra Nevada and that occur in old forest ecosystems." As reported in the 2004 Supplement, the Fish and Wildlife Service ("FWS") declared in February 2003 that the California spotted owl would not be listed as an endangered species under the Endangered Species Act because there was "no definite evidence that the population is decreasing across its range, and various analytical results of the individual study areas are not wholly supportive of conclusions regarding declines in any given study area."

However, because changes in the Sierra Nevada Framework could affect the California spotted owl, the FWS has stated that it will continue to monitor the owl. Within the last year, the FWS issued a "90-day finding" under the Endangered Species Act, 16 U.S.C. § 1533(b)(2)(A), as a prelude to a possible determination that the California spotted owl should be listed under the Act. 90-Day on a Petition to List the California Spotted Owl as Threatened or Endangered, 70

Fed. Reg. 35,607 (June 21, 2005). The FWS stated that “the petition presents substantial scientific or commercial evidence that listing the species may be warranted.” *Id.* The FWS is currently engaged in a 12-month review of the California spotted owl as required by 16 U.S.C. § 4(b)(3)(B). *Id.* Among the factors prompting the 12 month review was the 2004 Supplement, as well as new evidence concerning the effects of fires on the owls. *Id.* at 35,612.

Under the 2004 Supplement, PACs for California spotted owls must be maintained regardless of actual occupancy by owls. After a stand-replacing event such as a major fire, habitat conditions within a 1.5-mile radius around the PAC must be evaluated in order to identify opportunities for re-mapping a destroyed or diminished PAC. Only if there is insufficient suitable habitat for designating a PAC within this 1.5-mile radius can a PAC be delisted.

Earth Island argues that the FEISs allowed for excessive cutting of trees that would otherwise survive in areas used by California spotted owls, did not adequately take into account studies showing the owls’ use of already-burned areas, allowed the creation of isolated islands of habitat, and failed to retain sufficient numbers of large snags for use by owls. Earth Island relies upon the declaration of Monica Bond, who has a B.A. in Biology from Duke University and an M.S. in Wildlife Science from Oregon State University. She is the lead author of two peer reviewed studies of the California spotted owl published in 2002 and 2004. Bond contends that the Power and Fred Projects

will have significant negative effects on the California spotted owl by substantially reducing the amount of potential foraging habitat within the project sites, by a) utilizing inaccurate mortality guidelines (see Declaration of Edwin Royce) which incorrectly categorize some areas within the Power and Fred’s project areas as high-severity burn (and thus unsuit-

able for owls) when they are in fact live tree areas available to the owl for foraging purposes; b) ignoring significant new scientific information which indicates that spotted owls actually utilize forests burned at even high severities; c) by allowing pockets of forest unburned or burned at low- to moderate severity within a severe burn area to become isolated islands of habitat and reducing their value to the spotted owl; and d) failing to maintain large snags throughout the areas designated to be logged, for recruitment as legacy trees when the forest regenerates in the future. In addition, these projects call for extensive clearcut logging of habitat elements important to spotted owls (large trees and snags) within currently occupied spotted owl Protected Activity Centers (“PACs”) and Home Range Core Areas (“HRCAs”). All of these activities will result in the loss of potentially critical foraging grounds that are necessary to maintain the population of California spotted owls in the Eldorado National Forest.

The USFS responds with a declaration by Chuck Loffland, a wildlife biologist employed by the USFS. Loffland does not describe his academic background. He states that he has been conducting surveys of the California spotted owl and performing analyses of effects on the owl since 1989. He concedes that “it appears from the few studies cited by Ms. Bond that owls may use burned habitat to some degree,” but that “the scope and duration of that use are not well studied or well understood.” He notes that Bond herself states that more scientific study is needed. He states further:

Ms. Bond claims that most or all of the PACs will be clearcut. . . . This is simply untrue. First, there will be no salvage activity within suitable habitat. For the non-core (unsuitable) portion of PACs within the Power project area, salvage will only remove hazard trees and trees that are dead with 100%

crown kill in excess of the 4 largest size class snags per acre retained. This will leave behind 4 large snags/acre and *all* trees that have any green needles and even a remote chance of surviving. . . . Although Ms. Bond characterizes project activity in the PACs as wholly detrimental to the owl, the Forest Service decided to remove dead and hazard trees from non-core PAC areas in order to provide protection against stand-destroying fire. (emphasis in original).

Loffland also disputes some of Bond's characterizations of the logging that will take place within specified PACs.

According to the Power FEIS, there were approximately 5,880 acres of suitable owl habitat before the Power Fire; this habitat was reduced to 2,750 acres as a result of the fire. Ten PACs were in the Power Fire area before the fire. One was not affected by the fire and no treatment was proposed; one was burned at high and moderate intensity, and the USFS determined that not enough suitable habitat remained to support a PAC; and the boundaries of the remaining eight were redrawn to encompass the best remaining habitat within a 1.5 mile radius of the center of the area. Within seven of these redrawn PACs, the USFS determined that certain areas were unsuitable for spotted owl habitat (deemed "non-core" areas) and that salvage logging in these non-core areas could proceed, but leaving standing the four largest snags (dead trees) per acre. No logging is permitted within the "core," or suitable habitat, areas of any PAC.

An analysis of the direct effects of the Power Project was limited to the area that currently remains suitable for nesting or foraging. Because no logging is allowed in core areas, the Power FEIS notes that any direct effects would be limited to hazard zone areas, meaning roads, power line corridors, and the fire flume. Thus, the potential direct effects were limited to the removal of roadside hazard trees on 295 acres of key habitat within PACs. In addition, the Power Project is esti-

mated to affect 660 acres of the 10,560 total suitable HRCA acres that are within or adjacent to the Power Project area.

In discussing the indirect effects, the Power FEIS states that in high- and moderate-intensity burn areas in HRCAs, the largest 5.8 snags per acre will be retained, but that salvage harvesting will proceed according to the tractor-harvesting mortality guidelines. The cumulative effects analysis in the Power FEIS focused on logging activities proposed for 540 acres of private land within the Power Fire area and 873 acres of private land outside the area; on a project to thin trees in order to reduce fuel loads; and on the planned replanting of 700 acres of burned plantation areas.

The Power FEIS states that the effect of the Power Project may be to reduce the quality of owl habitat, but that the project would not reduce the overall amount of owl habitat. The Power FEIS predicts that to the extent the Power Project increases future fire resiliency, it may have the effect of increasing the amount of available habitat in the long run. It concludes that there would be no trend resulting in the federal listing of the California spotted owl as an endangered species.

In the Freds Fire area, all or portions of three spotted owl PACs were present before the fire. One PAC burned at high and moderate intensity, and the USFS determined that insufficient habitat remained to support this PAC. The boundaries of the remaining two PACs were redrawn to encompass the best 1.5 miles of habit surrounding the center of the area. The Freds FEIS proposed logging in non-core areas of the redrawn PACs.

According to the Freds FEIS, approximately 3,255 acres of suitable owl habitat existed on both national forest and private land before the Freds Fire. After the fire, only 285 suitable acres remained in areas of low-intensity burn, while approximately 1,848 acres remained in areas of moderate- and high-

intensity burn. In addition, some 332 acres of green trees are scattered across the moderate- and high-intensity burn areas.

According to the direct and indirect effects analysis in the Freds FEIS, no logging would take place in core areas within the PACs; no logging would be proposed in areas of low-intensity burn; and hardwoods and green trees would not be harvested in areas of moderate- and high-intensity burn. The FEIS also notes that while the 332 acres of remaining scattered green trees provide some post-fire habitat for the owls, suitability in those 332 acres would “likely be reduced over time as more fire-weakened trees die. Dead trees lose foliage and therefore would reduce canopy closure to levels below what is preferred by owls.”

The USFS argues that it adopted a conservative approach to logging in both FEISs in order to ensure that the California spotted owl is protected. It points to the fact that it assumed the presence of owls in PACs pending the completion of surveys. It also argues that it considered the information concerning the owl’s use of post-fire habitat and determined that the findings were too inconclusive to affect its impact analysis.

We have elsewhere interpreted the “hard look” requirement as entailing both a complete discussion of relevant issues as well as meaningful statements regarding the actual impact of proposed projects. In *Native Ecosystems Council*, we held that where an EIS used a calculation for determining the summer range of elk herd that was inconsistent with a specific requirement contained in the regional forest plan, the USFS had not taken a hard look because it did not “provide a full and fair discussion of the potential effects of the project . . . and did not inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts [to the elk at issue].” 418 F.3d at 965 (internal quotations and alterations omitted). Likewise, in *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 994-95 (9th Cir. 2004), we held that an environmental assessment

(“EA”) did not take a “hard look” at the cumulative impacts of a proposed action where the EA had sections devoted to discussing direct, cumulative, and foreseeable actions, but gave no objective or qualified assessment of the combined environmental impacts of the information presented. Most recently, we concluded that where an EIS stated without meaningful explanation that a post-fire salvage project would have a negative impact on black-backed woodpeckers but would not result in a trend toward federal listing, this did not constitute a “hard look.” *Ecology Ctr., Inc. v. Austin*, 430 F.3d 1057, 1067 (9th Cir. 2005).

In *Earth Island*, Earth Island claimed that the FEIS for the Star Fire Restoration Project did not adequately analyze the cumulative impact of the project’s destruction of an HRCA on the California spotted owl. *Earth Island*, 351 F.3d at 1306-07. While the FEIS in *Earth Island* had acknowledged that spotted owls exhibit “high site fidelity” and that a pair of owls had returned to the project area, it “never assessed the potential role of the remaining suitable habitat within the former HRCA for a maintained [PAC] despite the acknowledged presence of owls in the area.” *Id.* at 1307. For this reason, we held that the “omission amounts to an insufficient consideration of cumulative impact under NEPA.” *Id.*

We conclude that the Power and Freds FEISs have not taken the requisite “hard look” at the effects of the two projects on the California spotted owl. We concluded above that the FEISs did not adequately analyze probable tree mortality. The likely consequence of the apparent overprediction of tree mortality is excessive logging. This likely excessive logging, in turn, is likely to produce adverse effects on the California spotted owl that are not adequately analyzed in the FEISs.

Further, it is likely that the projects will substantially reduce potential foraging habitat because the FEISs’ designation of non-core areas, where logging will occur, is based upon the USFS’s determination that because these areas were

heavily burned they are not likely to be suitable owl habitat. According to Bond — both in her declaration and in her published work — the California spotted owl uses burned areas for foraging in the short-term, and these areas may also provide important benefits in the long-term.

[14] The FEISs cannot assume that simply because the owl habitat studies are preliminary, the adverse impacts discussed therein will not occur. Rather, the FEISs must respond explicitly and directly to conflicting views in order to satisfy NEPA’s procedural requirements. By removing trees that might survive in areas it assumes to be unsuitable for California spotted owl habitat, the FEISs allow logging in what could well be suitable habitat. The FEISs do not explain in any detail how their determinations that habitat was “unsuitable” were made, and do not investigate or analyze how redrawing the boundaries of the PACs and HRCAs might negatively impact the owls. We therefore conclude that the FEISs do not satisfy the requirement under NEPA that the agency take a “hard look” and that there be a “full and fair discussion” allowing informed public participation and informed decision-making.

B. Likelihood of Success on the Merits of Earth Island’s Challenge under the NFMA

[15] Earth Island argues that the FEISs’ reliance on the Breeding Bird Survey (“BBS”) does not satisfy its obligations under the NFMA to conduct population surveys for certain Management Indicator Species (“MIS”) bird species. The NFMA requires that a forest plan “comply with substantive requirements of the [NFMA] designed to ensure continued diversity of plant and animal communities and the continued viability of wildlife in the forest. . . .” *Austin*, 430 F.3d at 1063; *see also* 16 U.S.C. § 1604(g)(3)(B). The 2001 Framework identifies certain birds as MIS species, for which increased population monitoring is required. The 2004 Sup-

plement incorporates the 2001 Framework's population-monitoring requirements.

The El Dorado National Forest Land and Resource Management Plan ("LMRP"), as well as both the Freds and Power FEISs, list cavity-nesting birds, including the black-backed woodpecker, hairy woodpecker, and Williamson's sapsucker, as MIS species. An MIS species is a bellwether, or class representative, "for other species that have the same special habitat needs of population characteristics." *Inland Empire Pub. Lands Council v. U.S. Forest Serv.*, 88 F.3d 754, 762 n.11 (9th Cir. 1996). The 2001 Framework states, "[p]opulation and/or habitat monitoring will be conducted for all MIS and species at risk. Varying levels of monitoring will be conducted depending on the level of concern associated with each species; as the level of concern about a species increases, the investment in monitoring increases." The 2001 Framework allows for a very limited degree of habitat monitoring in lieu of actual population monitoring, stating that "coarse habitat relationships constitute a relatively insensitive index to the status of populations and would only be appropriate for species with a lower level of concern or for which the status of the population were also being monitored."

According to the 2001 Framework, the hairy woodpecker and Williamson's sapsucker are low-vulnerability MIS species. Low-vulnerability species are monitored to determine changes in their distribution. Distribution data consist of "changes in the presence of species across a number of sample locations" and is a "spatially explicit version of frequency of occurrence data." In addition, the 2001 Framework notes that in an area as large as the Sierra Nevadas, "changes in the distribution of species represent ecologically significant information on the status and change of populations." Appendix E of the 2001 Framework makes explicit that population data must be collected for the hairy woodpecker and Williamson's sapsucker. The black-backed woodpecker is not specifically

mentioned in the 2001 Framework, but it is designated as an MIS species in the LMRP and in the two FEISs.

As a preliminary matter, we conclude that NFMA regulations promulgated in 1982 apply to the 2001 Framework and 2004 Supplement. These regulations require population monitoring. *See* 36 C.F.R. § 219. Because the 2001 Framework and 2004 Supplement were developed based on regulations in effect before November 9, 2000, transitional rules, now contained at 36 C.F.R. § 219.14, govern this case. The applicable regulation provides:

For units with plans developed, amended, or revised using the provisions of the planning rule in effect prior to November 9, 2000, the Responsible Official may comply with any obligations relating to management indicator species by considering data and analysis relating to habitat *unless the plan specifically requires population monitoring or population surveys for the species*. Site-specific monitoring or surveying of a proposed project or activity area is not required, but may be conducted at the discretion of the Responsible Official.

36 C.F.R. § 219.14(f) (emphasis added).

The district court found that in light of the hairy woodpecker and Williamson's sapsucker's classification as "low vulnerability" species, a lower level of monitoring is envisioned for these birds, and that the use of BBS data satisfies this lower level of monitoring. Earth Island argues that the district court erred because the BBS data are insufficient and inaccurate.

The BBS is a cooperative program sponsored by the governments of the United States and Canada to monitor several North American bird species. Under the BBS, the Williamson's sapsucker and black-backed woodpecker are listed in

the “red” category, meaning that the results are “very imprecise” and the data suffer from low regional abundance and small sample sizes. The hairy woodpecker is listed in the “blue” category, which reflects data of “moderate precision” and of “moderate abundance,” but which still “may not provide valid results.” The BBS notes other potential problems in its overall data collection, specifically that the trends do not take into account activity outside of the range of the survey; that the surveys are only conducted by roadside, and “may not be representative of regional habitat changes”; and that within the range of the survey, many habitats are not well covered and that species within those habitats are consequently “poorly sampled.”

Although not controlling on this court, *Sierra Club v. Eubanks*, 335 F. Supp. 2d 1070 (E.D. Ca. 2004), is instructive. In *Eubanks*, the same district judge as in this case granted a preliminary injunction against the logging and proposed timber sale provided in the Red Star Restoration Project. *Id.* at 1073. The Tahoe Forest Plan expressly provided for annual population monitoring of MIS species, and it listed each species “‘for which population trend data is expected to be obtained.’” *Id.* at 1081 (quoting the administrative record). The USFS argued that population survey information was not required as long as MIS habitats were adequately analyzed, and that because the Red Star Restoration Project would not diminish the habitat for MIS species, actual monitoring was not required. *Id.* The district court agreed with this premise, stating that “[h]abitat analysis is an acceptable substitute for population trend data if there is enough underlying data to support such an analysis. . . .” *Id.* at 1082. Nevertheless, the district court concluded that the Red Star Restoration Project failed to comply with the El Dorado LRMP, the Sierra Nevada Framework, and the NFMA because underlying data for MIS species that could provide the necessary information for a habitat analysis did not exist. *Id.*

In its order denying Earth Island’s request for a preliminary injunction, the district court distinguished *Eubanks* by con-

cluding that in this case, such underlying data, in the form of the BBS, do exist. In support of this conclusion, the district court relied upon *Forest Conservation Council v. Jacobs*, 374 F. Supp. 2d 1187, 1207 (N.D. Ga. 2005). In *Jacobs*, the district court found that the BBS provided sufficient data. However in *Jacobs*, the USFS relied on other data in addition to the BBS. *Id.* at 1205.

We do allow the USFS to conduct habitat analyses in place of population monitoring under certain circumstances. In *Inland Empire Public Lands Council*, various environmental groups claimed that an EIS did not perform a proper population analysis under the NFMA for several sensitive species living in a project area, including the black-backed woodpecker. 88 F.3d at 759. We upheld the USFS's use of a habitat management analysis where the USFS had (1) consulted field studies showing how many acres of territory an individual species needed; (2) assumed that the amount of acreage remained constant no matter the actual size of the individual species' territory; and then (3) examined the proposed alternatives to see how many acres of necessary habitat remained after the timber was harvested. *Id.* We also upheld the USFS's decision to not engage in a detailed analysis of one species because nesting and feeding habitat requirements were not available, stating that "an analysis that uses all the scientific data currently available is a sound one." *Id.* at 762.

[16] The USFS relies upon *Inland Empire* to argue that by analyzing the amount of habitat affected, rather than direct population counts of the birds, it has satisfied the NFMA. This argument fails for two reasons. First, a plain reading of the regulations does not support the USFS's argument. The transitional rules state that the USFS may use habitat analysis in lieu of population monitoring only when a forest plan does not specifically require population monitoring. The 2001 Framework and 2004 Supplement provide that the USFS may use "population monitoring *and/or* habitat analyses." However, in discussing the hairy woodpecker and Williamson's

sapsucker, the Framework expressly requires “population monitoring,” specifically in the form of “distribution data.” It is difficult to see how distribution data could effectively be gathered in the absence of actual population monitoring, and we reject the USFS’s argument that it is under no obligation to determine population trends for the hairy woodpecker or Williamson’s sapsucker.

Second, although we agree that the USFS could have relied on habitat monitoring for the black-backed woodpecker, the USFS has not conducted a habitat analysis on the level of that found satisfactory in *Inland Empire*. See *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146 (9th Cir. 1998) (allowing habitat analysis under the NFMA in certain circumstances). The FEISs discuss various studies of black-backed woodpeckers that confirm their preference for burned forest habitat. Table 3-52 of the Power FEIS groups cavity-nesting birds into three different species groups, lists the areas included in the project areas that are “assumed to provide high and moderate capability habitat,” and then lists the number of available acres of high and moderate capability habitat. There is no indication that the USFS consulted current or accurate field studies to arrive at these numbers, and there is no identification of the methodology used in determining what constitutes suitable habitat.

[17] As we stated in *Native Ecosystems Council*, “[o]ur case law permits the Forest Service to meet the wildlife species viability requirements by preserving habitat, but only where both the Forest Service’s knowledge of what quality and quantity of habitat is necessary to support the species and the Forest Service’s method for measuring the existing amount of that habitat are reasonably reliable and accurate.” 428 F.3d at 1250. In *Austin*, we noted that the black-backed woodpecker is “particularly dependent upon post-fire landscapes.” 430 F.3d at 1065. There, we concluded that the USFS had failed to provide a factual basis sufficient to satisfy the NFMA because the EIS did not indicate how the USFS

determined that habitat levels were not critically low or how it planned to generate additional habitat to counteract losses from logging. *Id.* at 1068. We likewise conclude here that because the USFS's habitat analysis of the black-backed woodpecker has not provided a factual basis for determining the quantity or quality of suitable habitat, its analysis does not satisfy the NFMA.

We also conclude that the USFS's reliance on BBS data to meet its population monitoring obligation was arbitrary and capricious. Table 3-53 in the Power FEIS (Table 3-54 in the Freds FEIS) is entitled "Population trend of cavity-nesting birds." Immediately beneath the table, the FEIS states, "NOTE: based upon Breeding Bird Survey routes in the Sierra Nevada physiographic province, from 1996-2003." Table 3-53 then proceeds to list the population status of the hairy woodpecker as "Decreasing" and the population status of the Williamson's sapsucker as "Unknown." The population status of the black-backed woodpecker is also listed as "Unknown." A footnote to the hairy woodpecker figure states, "Data is not statistically significant; tendency is estimated using the population trend classification system described in Siegel and deSante (1999)."

[18] The 2004 Supplement specifically mentions the need for annual monitoring of MIS species, stating that only after a period of annual monitoring will there be "sufficient understanding of important habitat characteristics that we can confidently monitor habitat without annual monitoring of species' distribution and abundance." We therefore disagree with the USFS that annual monitoring is not required. The USFS has not complied with 36 C.F.R. § 219.19 because it has not sufficiently monitored the population of the hairy woodpecker and Williamson's sapsucker. We hold that the BBS alone cannot satisfy the population monitoring requirement, and the USFS has acted arbitrarily and capriciously under the NFMA in relying upon it. *Cf. Colo. Wild v. U.S. Forest Serv.*, 299 F. Supp. 2d 1184, 1189 (D. Colo. 2004) (holding that where an

FEIS stated that it “lacks qualitative data” for one species, had “no specific data” for another, and was “currently in the process of establishing a monitoring program” for a third, the USFS had not met its monitoring obligations under the 1982 regulations); *Forest Guardians v. U.S. Forest Serv.*, 180 F. Supp. 2d 1273, 1282 (D. N.M. 2001) (holding that under the 1982 regulations, the BBS did not satisfy the monitoring requirement where the district court could not tell whether population surveys had been conducted for the area at issue). With respect to the black-backed woodpecker, we also hold that the USFS has acted arbitrarily and capriciously by relying on inadequate habitat monitoring data. *See Lands Council v. Powell*, 395 F.3d 1019, 1036 (9th Cir. 2005) (holding that the USFS violated the NFMA where the data for a habitat analysis were outdated and featured inaccurate estimates).

[19] The USFS’s approval and implementation of both Projects without appropriate or sufficient population and habitat data is contrary to the NFMA and governing provisions of the forest plan. The district court erred in finding otherwise.

C. Overall Likelihood of Success on the Merits

[20] For the foregoing reasons, we conclude that Earth Island has shown a “strong likelihood of success on the merits” of both its NEPA and NFMA challenges to the Power and Feds FEISs and RODs. *Earth Island*, 351 F.3d at 1297. We now evaluate the remaining criteria for granting a preliminary injunction.

D. Possibility of Irreparable Injury, Balance of Hardships, and Advancement of the Public Interest

Because Earth Island has shown “a strong likelihood of success on the merits,” it need only show “the possibility of irreparable injury” if preliminary relief is not granted, and that the “balance of hardships” tips in its favor. *Id.* Further, in this case it is appropriate that it be required to show “the advance-

ment of the public interest.” *Id.*; *Kootenai Tribe v. Veneman*, 313 F.3d 1094, 1125 (9th Cir. 2002) (“[W]here the purpose of the challenged action is to benefit the environment, the public interest must be taken into account in balancing the hardships”).

[21] The “possibility of irreparable injury” has clearly been shown. We have stated that “[e]nvironmental injury, by its nature, can seldom be adequately remedied by money damages and is often permanent or at least of long duration, i.e., irreparable.” *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 737 (9th Cir. 2001) (internal quotations omitted). In this case, Earth Island contends that the Power and Freds Projects may result in the unnecessary cutting of trees that would otherwise survive, in harm to the California spotted owl, and in harm to several MIS bird species. Earth Island has certainly shown that there is a possibility of such injury, and that such injury is irreparable.

[22] The balance of hardships also tips in Earth Island’s favor. The USFS and SPI contend, with some reason, that they will suffer economic losses if we enjoin the timber sales. But in *Babbitt*, we stated that a cruise ship’s “loss of anticipated revenues . . . does not outweigh the potential irreparable damage to the environment.” *Id.* at 738. Further, in *Earth Island* we noted the importance of preserving the public’s interest in “preserving precious, unreplenishable resources.” *Earth Island*, 351 F.3d at 1309 (quoting *Kootenai Tribe*, 313 F.3d at 1125).

Finally, we believe that a preliminary injunction advances the public interest. The preservation of our environment, as required by NEPA and the NFMA, is clearly in the public interest.

Conclusion

We have noticed a disturbing trend in the USFS’s recent timber-harvesting and timber-sale activities. *See, e.g., Ecol-*

ogy Ctr., Inc. v. Austin, 430 F.3d 1057 (9th Cir. 2005) (holding that the USFS's post-fire treatment of old-growth forest stands in the Lolo National Forest violated both the NFMA and NEPA, and that the EIS failed to explain adequately the adverse impacts of the proposed plan on the black-backed woodpecker); *Lands Council v. Powell*, 395 F.3d 1019 (9th Cir. 2005) (reversing the district court's grant of summary judgment to the USFS because its EIS did not take a "hard look" at past timber harvests or current trout habitat conditions); *Idaho Sporting Cong. v. Rittenhouse*, 305 F.3d 957 (9th Cir. 2002) (remanding to the district court to enjoin two timber sales approved in violation of the NFMA and NEPA). See also *Utah Envtl. Cong. v. Bosworth*, 421 F.3d 1105 (10th Cir. 2005) (holding that the USFS did not properly monitor MIS species and did not consider a reasonable range of alternatives in a proposed timber-harvesting project); *Sierra Club v. Eubanks*, 335 F. Supp. 2d 1070 (E.D. Cal. 2004) (granting a preliminary injunction against salvage logging provided for in the USFS's post-fire Red Star Restoration Project); *Sierra Club v. Bosworth*, 199 F. Supp. 2d 971 (N.D. Cal. 2002) (rejecting the USFS's argument that post-fire salvage burning was needed to prevent a future fire and enjoining implementation of post-fire salvage logging); *Colo. Wild v. U.S. Forest Serv.*, 299 F.Supp.2d 1184 (D. Colo. 2004) (granting a preliminary injunction of a timber salvage project because the USFS failed to gather population data for MIS species); *Forest Guardians v. U.S. Forest Serv.*, 180 F. Supp. 2d 1273 (D. N.M. 2001) (reversing authorization of a timber sale in the Cibola National Forest because of the USFS's failure to collect adequate MIS population data).

It has not escaped our notice that the USFS has a substantial financial interest in the harvesting of timber in the National Forest. We regret to say that in this case, like the others just cited, the USFS appears to have been more interested in harvesting timber than in complying with our environmental laws.

[23] We reverse the district court's denial of Earth Island's request for a preliminary injunction, and we remand to the district court for proceedings consistent with this opinion. Our injunction pending appeal shall remain in effect for 30 days following the issuance of the mandate in order to allow the district court sufficient time to fashion such preliminary injunctive relief as it deems appropriate consistent with this opinion.

REVERSED AND REMANDED.

NOONAN, Circuit Judge, concurring:

There is no doubt that the district court articulated the wrong standard as to the possibility of harm that the plaintiffs must show. *Earth Island v. United States Forest Service*, 351 F.3d 1291, 1298 (9th Cir. 2003) (*Earth Island I*). There is also no doubt in my mind that the financial interest of the Forest Service requires further investigation and evaluation. *See id.* at 1309 (Noonan, J., concurring). That the parties have not pursued this problem does not give the Forest Service a pass. If it is indeed a biased adjudicator, its determination is a nullity. *Tumey v. Ohio*, 273 U.S. 510, 521 (1927).

It is not too difficult for a court of appeals to discern the correct legal standard for an injunction and to see the problem created by a financial interest on the part of the adjudicator. It is more difficult for this court to master the massive record in an environmental case and to be confident in its discrimination between expert opinions. Recognizing the mastery of the available data that distinguishes the majority opinion, I cannot say that I am sure as to Earth Island's probable success. I would remand to the district judge (1) to obtain information as to the importance of the sales to the Forest Service's operation; (2) to apply the correct legal standard; and (3) to make

its own estimate of the probability of Earth Island's success on the merits.